

What is claimed is:

1. A putter comprising:
 - a grip having an anatomically correct shape to promote proper grasping of the putter;
 - a shaft having a first end and a second end, wherein the grip is attached to the first end of the shaft;
 - a hosel attached to the second end of the shaft;
 - a head attached to the hosel, the head having a striking face; and
 - an alignment feature of the putter adapted to ensure correct assembly of the head onto the shaft.
2. The putter according to claim 1, wherein grasping the anatomically correct shape of the grip properly aligns the striking face of the head with a ball.
3. The putter according to claim 1, wherein the anatomically correct shape of the grip includes a portion having a cardioid shaped cross section.
4. The putter according to claim 1, wherein the grip is attached to the first end of the shaft by molding the grip over the shaft.
5. The putter according to claim 1, further comprising a head orientation feature of the shaft, the head orientation feature being adapted to emphasize the orientation of the head.
6. The putter according to claim 5, wherein the head orientation feature comprises a curved surface of the shaft, the curved surface being adapted to magnify visual cues showing rotation of the shaft.

7. The putter according to claim 6, wherein the curved surface is an upwardly convex surface.
8. The putter according to claim 1, wherein the alignment feature comprises a unidirectionally shaped connecting end of the hosel, and a corresponding unidirectionally shaped portion of the head connecting with the hosel.
9. The putter according to claim 8, wherein the unidirectionally shaped connecting end of the shaft comprises a shaped protrusion fitting in a corresponding shaped via of the head.
10. The putter according to claim 9, wherein the connecting end protrusion is elliptically shaped.
11. The putter according to claim 8, wherein the alignment feature limits a depth of penetration of the hosel into the head.
12. The putter according to claim 1, wherein the hosel includes an aiming feature adapted to emphasize an orientation of the head.
13. The putter according to claim 12, wherein the aiming feature comprises an arc having an arc center point, the arc center point being adapted to magnify visual cues showing the orientation of the head.
14. The putter according to claim 1, wherein the hosel includes a vibration damper to prevent vibration from radiating from the head to the shaft.
15. The putter according to claim 1, wherein the striking surface has a loft angle of approximately 1 - 5 degrees.

16. The putter according to claim 1, further comprising an eye collimating device of the head, the eye collimating device comprises a recess having surfaces adapted to visually display orientation of the head by parallax.

page 20

17. The putter according to claim 16, wherein the recess further comprises:

a bottom surface substantially perpendicular to the striking face and substantially parallel to a top surface of the head;

a first side surface substantially perpendicular to the bottom surface;

a second side surface substantially perpendicular to the bottom surface and substantially parallel to the first side surface; and

a front surface substantially perpendicular to the bottom surface and substantially perpendicular to the first and second side surfaces, wherein, when eyes of a player are properly aligned with the head, the bottom surface of the recess and the top surface of the head appear as a substantially continuous surface and the first and second side surfaces and the front surface appear as lines in the substantially continuous surface.

18. The putter according to claim 1, wherein each of the grip, the shaft, the hosel and the head are formed from one of a polymer material and a composite material.

19. The putter according to claim 1, further comprising a weighting system of the head adjustable in at least one of three dimensions in the head, a first adjustable dimension being from the striking surface to a back surface of the head, a second adjustable dimension being from a top surface of the head to a bottom surface of the head and a third adjustable dimension being from a first side surface of the head to a second side surface of the head.

20. The putter according to claim 1, further comprising a first balancing weight disposed in the grip and a second balancing weight disposed in the head.

21. The putter according to claim 1, further comprising a weighting system of the grip adjustable along an axis of the grip.
22. The putter according to claim 21, wherein the weighting system comprises:
a cavity formed in the grip; and
weights adapted to fit in the cavity in a selected position along the axis of the grip.
23. A putter system for assisting a golfer in completing a putt, the system comprising:
a grip for anatomically matching the golfer's hands, the handle preferentially orienting in a selected direction when gripped;
a shaft extending from the grip, the shaft providing visual indication of a preferred orientation of the shaft to the golfer;
a head integrated with the shaft, the head providing visual indication to the golfer of a preferred orientation of the head; and
an alignment feature adapted to precisely align the head with the shaft.
24. The putter system according to claim 23, further comprising a parallax collimating device of the head for visually indicating to the golfer when a preferred stance is maintained.
25. The putter system according to claim 23, further comprising adjustable weighting systems to customize the putter system.
26. The putter system according to claim 23, further comprising a weighting system of the head adapted to move a center of gravity of the head along three axes and to vary a mass of the head.

27. The putter system according to claim 27, further comprising a weighting system of the grip adapted to balance the putter system in conjunction with the weighing system of the head.

28. A grip for a golf club, comprising:

a monolithic piece having an end for attaching the grip to a shaft of the golf club, wherein the monolithic piece is an anatomically correct shape to promote proper grasping of the grip along a length of the monolithic piece.

(102) shaft & head (108)

29. The grip according to claim 28, wherein the anatomically correct shape has a cardioid shaped cross section.

30. The grip according to claim 29, wherein the cardioid shaped cross section has a maximum diameter of approximately 1 3/4 inches.

31. The grip according to claim 28, wherein the monolithic piece is made of one of a polymer and a composite material.

32. The grip according to claim 31, wherein the one of the polymer and composite material is impregnated with material to change a weight of the monolithic piece.

33. The grip according to claim 28, wherein the monolithic piece is non-tapered.

34. The grip according to claim 28, wherein a surface of the monolithic piece is textured.

35. The grip according to claim 28, further comprising a weighting system adjustable along an axis of the grip.

10090133-022802

36. The grip according to claim 35, wherein the weighting system comprises:
a cavity formed in the grip; and
weights adapted to fit in the cavity in a selected position along the axis of the grip.
37. A shaft for a golf club, comprising:
a monolithic piece formed of one of a polymer and composite material, having a shaft portion for attaching to a grip of the golf club and a hosel portion for attaching to a head of the golf club, wherein the shaft portion includes a head orientation feature adapted to emphasize an orientation of the head.
38. The shaft according to claim 37, wherein the head orientation feature comprises a curved surface of the shaft, the curved surface being adapted to magnify visual cues showing rotation of the shaft.
39. The shaft according to claim 38, wherein the curved surface is an upwardly convex surface.
40. The shaft according to claim 38, wherein the curved surface is a top portion of one of an oval cross section of the shaft and a rounded triangular cross section of the shaft.
41. The shaft according to claim 38, wherein the curved surface is one of coated and textured to amplify the visual cues.
42. The shaft according to claim 37, wherein a hollow cavity runs longitudinally through the shaft portion.

43. The shaft according to claim 37, wherein a cross-sectional shape of the shaft portion is symmetric about two axes.
44. The shaft according to claim 37, wherein the shaft portion is non-tapered.
45. The shaft according to claim 37, wherein the shaft portion has a first end having a larger cross section than a second end.
46. The shaft according to claim 37, wherein the monolithic piece includes a transition region which provides a smooth transition between the shaft portion and the hosel portion.
47. The shaft according to claim 37, wherein the monolithic piece includes a solid core around which the one of the polymer and composite material is molded.
48. The shaft according to claim 37, wherein the hosel includes an aiming feature adapted to emphasize the orientation of the head.
49. The shaft according to claim 48, wherein the aiming feature comprises an arc having an arc center point, the arc center point being adapted to magnify visual cues showing improper orientation of the head.
50. A head for a putter, comprising:
a body piece formed of one of a polymer and composite material having a striking face and a ball aiming feature adapted to facilitate obtaining a proper relationship between the head and a ball.
51. The head according to claim 50, wherein the ball aiming feature of the head comprises a perimeter of the head having edges perpendicular and parallel to a

preferred direction of motion of the head.

52. The head according to claim 51, wherein the perimeter is rectangular, with sides perpendicular and parallel to the preferred direction of motion.

53. The head according to claim 50, wherein the striking face is textured.

54. The head according to claim 50, wherein the striking surface has a loft angle of about 1 - 5 degrees.

55. The head according to claim 50, further comprising an eye collimating device, the eye collimating device comprises a recess having surfaces adapted to visually display orientation of the head by parallax.

56. The head according to claim 55, wherein the recess further comprises:
a bottom surface substantially perpendicular to the striking face and substantially parallel to a top surface of the head;
a first side surface substantially perpendicular to the bottom surface;
a second side surface substantially perpendicular to the bottom surface and substantially parallel to the first side surface; and
a front surface substantially perpendicular to the bottom surface and substantially perpendicular to the first and second side surfaces, wherein, when eyes of a player are properly aligned with the head, the bottom surface of the recess and the top surface of the head appear as a substantially continuous surface and the first and second side surfaces and the front surface appear as lines in the substantially continuous surface.

57. The head according to claim 55, wherein the recess has a rectangular plan.

58. The head according to claim 55, wherein the recess has one of a color and texture to enhance the visual display of the head orientation.

59. The head according to claim 50, further comprising a weighting system adjustable in at least one of three dimensions in the head, a first adjustable dimension being from the striking surface to a back surface of the head, a second adjustable dimension being from a top surface of the head to a bottom surface of the head and a third adjustable dimension being from a first side surface of the head to a second side surface of the head.

60. The head according to claim 59, wherein the weighting system further comprises:

a first cavity formed in the head, the first cavity penetrating the head from the back surface to a predetermined depth within the head, the predetermined depth being less than the depth of the head;

a second cavity formed in the head, the second cavity being laterally spaced from the first cavity, the second cavity penetrating the head from the back surface to the predetermined depth within the head; and

weights adapted for fitting in the cavities, a location of the weights being selectable along the predetermined depth of each of the cavities.

61. The head according to claim 60, wherein the weights are asymmetrical about a longitudinal axis.

62. The head according to claim 60, wherein the cavities have one of a cap and a door to seal the cavities.

63. A method of manufacturing a putter comprising the steps of:
molding a grip of the putter;
molding a shaft of the putter, the shaft having a shaft portion and a hosel portion;
molding a head of the putter, said head having a striking surface;
forming an alignment feature of the putter; and
attaching the head to the hosel portion of the shaft, using the alignment feature
to ensure correct alignment of the head with the shaft.
64. The method according to claim 63, wherein the material for the putter includes
one of a polymer and a composite material.
65. The method according to claim 63, wherein the molding steps include one of
injection molding and compression molding.

2008220-EEF00001